UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,674	09/15/2003	Koichi Osawa	117150	9133

25944 7590 06/30/2005

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
TRAN, BINH Q	
ART UNIT	**PAPER NUMBER**
3748	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/661,674	OSAWA ET AL.	
	Examiner	Art Unit	
	BINH Q. TRAN	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,9,15-17,19 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,9,15-17,19 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the amendment filed April 12, 2005.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1-5, 9, 15-17, 19, and 22 are rejected under 35 U.S.C. 102 (b) as being anticipated by Kusada et al. (Kusada) (Patent Number 6,173,569).

Regarding claims 1, 9, 15, 19, and 22, Kusada discloses a power output apparatus comprising: an engine (1) including a combustion chamber (4); a fuel supply device (12) for supplying fuel into the combustion chamber; an exhaust gas purification device (15) for purifying gas emitted from the combustion chamber by a catalyst; and a control device (40) for controlling said fuel supply device to perform a fuel supply stop process of stopping supply of the fuel after performing a fuel increase process of increasing an amount of the fuel in the

combustion chamber from that at a present state, as a control for preventing deterioration of the catalyst upon stopping said engine (e.g. See Fig. 1-6; col. 5, lines 24-67; col. 6, lines 1-57; Steps 301-311 and 601-606); and a motor generator (e.g. MG1, MG2) apparatus which can generate electric power by using at least one portion of an output of said engine and which can output a driving force through a drive shaft (e.g. See col. 4, lines 39-61).

Regarding claim 2, Kusada further discloses that the control device controls said fuel supply device such that a start time point of the fuel supply stop process coincides with a start time point of a process of stopping said engine (e.g. See Fig. 1-6; Steps 301-311 and 601-606).

Regarding claim 3, Kusada further discloses that the control device controls said fuel supply device to perform the fuel increase process depending on a temperature of the catalyst (e.g. See col. 6, lines 14-57).

Regarding claim 4, Kusada further discloses that the control device controls said fuel supply device to perform the fuel increase process if the temperature of the catalyst is above a predetermined temperature threshold value (e.g. See col. 6, lines 14-57).

Regarding claim 5, Kusada further discloses that the control device controls said fuel supply device such that a start time point of the fuel supply stop process is after passing two to three seconds from a start time point of the fuel increase process (e.g. See Fig. 1-6; Steps 301-311 and 601-606).

Regarding claim 16, Kusada further discloses that the engine performs an intermittent operation, and a stop time point of said engine includes a transition time point from an operating period to a down period in the intermittent operation (e.g. See Fig. 1-6; col. 5, lines 24-67; col. 6, lines 1-57; Steps 301-311 and 601-606).

Regarding claim 17, Kusada further discloses that the a fuel increase process of increasing an amount of fuel in the combustion chamber from that at a present state upon stopping the engine; and a fuel supply stop process of stopping supply of the fuel after said fuel increase process upon stopping the engine (e.g. See Fig. 1-6; col. 5, lines 24-67; col. 6, lines 1-57; Steps 301-311 and 601-606).

Response to Arguments

Applicant's arguments filed April 12, 2005 have been fully considered but they are not deemed persuasive in part. ***Claims 1-5, 9, 15-17, 19, and 22 are pending.***

Applicant's cooperation in amending the claims to overcome the claim rejections is also appreciated.

Applicants have argued that Kusada et al. does not teach or suggest Applicant's claimed invention. More specifically, Applicants assert that the reference to Kusada fails to disclose *a control device for controlling said fuel supply device to perform first a fuel increase process of increasing an amount of the fuel in the combustion chamber from that at a present state, and perform second a fuel supply stop process of stopping supply of the fuel, as a control for preventing deterioration of the catalyst upon stopping said engine; and controlling at least said fuel supply device such that a ratio of fuel in an atmosphere around the catalyst is greater than a ratio of air in the atmosphere, as a control for preventing deterioration of the catalyst upon stopping said engine.* The examiner respectfully disagrees, in column 5, lines 42-67; and column 6, lines 1-58, Kusada has clearly disclosed that *"During a time period T1, the vehicle running condition is an ordinary running condition. During this time period, the drive motor MG2 is*

driven and the engine is also in operation. ... More specifically, ***a fuel injection amount is determined by correcting the basic fuel injection amount Tp so that the air-fuel ratio of exhaust gas flowing into the catalyst becomes equal to a target air-fuel ratio (e.g., the theoretical air-fuel ratio),*** *based on the outputs of the upstream and downstream air-fuel ratio sensors. The thus-determined fuel injection amount is supplied into the engine from each fuel injection valve at a predetermined injection timing. The predetermined injection timing is determined by a conventionally-employed fuel injection calculating routine. During the time period T1, the output of the upstream air-fuel ratio sensor has a shorter rich/lean reversion period than the output of the downstream air-fuel ratio sensor, as indicated in FIG. 2. During a time period T2, the vehicle is in a decelerating condition. During this time period, the drive motor MG2 operates as a generator to perform regenerative braking.* ***Fuel to the engine is cut in a high-revolution speed region, and the engine is stopped in a low-to-intermediate revolution speed region. Therefore, the amount of fuel supplied into the engine becomes zero. During the time period T2, oxygen is discharged from the engine, so that an excessive-oxygen condition is established. Therefore, the outputs of the downstream and upstream air-fuel ratio sensors exhibit a maximum lean output Lmax.*** *During a time period T3, the vehicle is in a light load running condition. During this time period, the drive motor MG2 is driven* ***and the engine is kept stopped.*** *Therefore, the outputs of the upstream and downstream air-fuel ratio sensors are maintained at the maximum lean output Lmax during the time period T3, as indicated in FIG. 2. Based on consideration of this fact, the catalyst deterioration detection according to the invention has been developed. In a system in which a motor is not provided as a power source, when the air-fuel ratio is switched to the rich side after execution of the engine*

fuel cut control, the catalyst deterioration detection is performed based on the length of time up to the switching of the air-fuel ratio of exhaust gas flowing downstream of the catalyst from the lean side to the rich side. ***However, during execution of the fuel cut control, the catalyst hardly ever stores oxygen up to the limit of oxygen storing capacity of the catalyst, so that deterioration of the catalyst cannot be detected with good precision. In contrast, in this embodiment, if the engine is stopped when the catalyst atmosphere contains an excess amount of oxygen, transfer of heat from the catalyst to the outside of the catalyst by exhaust gas is considerably reduced, so that the decreasing rate of the catalyst temperature becomes small.*** *As a result, a condition in which an excess amount of oxygen is present near the catalyst and the catalyst has a relatively high temperature that allows the catalyst to store oxygen is maintained. That is, during the time period T3, the catalyst takes up and stores oxygen up to the limit of the oxygen storing capacity of the catalyst, so that the catalyst deterioration detection precision can be increased.....".*

In addition, in column 8, lines 48-67; and column 9, lines 1-14; Kusada has also disclosed that *" FIG. 6 is a flowchart illustrating the catalyst deterioration detecting routine according to the invention. This routine is periodically executed at predetermined intervals, for example, every 100 ms. In step 601 of the routine, it is determined whether a predetermined time has elapsed following the restart of the engine. If the determination is affirmative, the process proceeds to step 602. If the determination is negative, the process proceeds to step 603.* ***In step 603, a rich air-fuel ratio is set so as to supply a fuel-rich mixture to the engine during the predetermined period. A rich air-fuel ratio can be set by performing a fuel increasing correction on the basic fuel injection amount Tp calculated from a map that is determined by***

the intake air flow and the revolution speed of the engine. In step 602, on the other hand, the fuel increasing correction is discontinued to resume normal fuel supply. After step 602, the execution of the routine ends. In step 604, a fuel-lean duration T.sub.LEAN UP to the switching of the output of the downstream air-fuel ratio sensor from the rich side to the lean side during a period during which the air-fuel ratio was set to the rich side is measured. This time measurement is performed by summing up time (T.sub.LEAN =T.sub.LEAN +1). The initial setting of T.sub.LEAN is zero. Subsequently in step 605, it is determined whether the fuel-lean duration T.sub.LEAN measured in step 604 is equal to or greater than a predetermined length of time T.sub.A (T.sub.LEAN.gtoreq.T.sub.A). *If the determination in step 605 is affirmative, it is considered that the catalyst has not significantly deteriorated. Then, the execution of the routine ends. If the determination in step 605 is negative, it is considered that the oxygen storing capacity of the catalyst has decreased and therefore the catalyst has significantly deteriorated. The process then proceeds to step 606, in which an indicator lamp (not shown) is turned on. The foregoing embodiment detects whether the catalyst has deteriorated when the engine is started upon an increase in the requested torque. However, it is also possible to detect whether the catalyst has deteriorated when the engine is started due to a factor irrelevant to the requested torque.".* It is clearly that Kusada has disclosed a control device for controlling said fuel supply device to perform first a fuel increase process of increasing an amount of the fuel in the combustion chamber from that at a present state (e.g. *During a time period T1*), and perform second a fuel supply stop process of stopping supply of the fuel (e.g. *During a time period T2*), as a control for preventing deterioration of the catalyst upon stopping said engine; and controlling at least said fuel supply device such that a ratio of

fuel in an atmosphere around the catalyst is greater than a ratio of air in the atmosphere, as a control for preventing deterioration of the catalyst upon stopping said engine.

Applicant's amendment (Claims 1-5, 9, 15-17, 19, and 22) necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL See MPEP. 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Binh Tran whose telephone number is (571) 272-4865. The examiner can normally be reached on Monday-Friday from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reach on (571) 272-4859. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BT
June 24, 2005

Binh Q. Tran
Patent Examiner
Art Unit 3748